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AM20EWM-NZ



2 x 1”

The AM20EWM-NZ is a brand-new 20W medical grade DC/DC converter that offers 4:1 ultra-wide input voltage range and meets the 2xMOPP EN60601-1 third edition medical grade standard. This series will offer many benefits to your new medical grade system design that has high isolation requirements.
This series offers great operating temperatures, from -40°C to +85°C with full power up to 55°C. It also features an isolation of 5000VAC for improved reliability and system safety. Furthermore, a high MTBF of 1,000,000h, output short circuit protection (OSCP), output over-current protection (OCP), output over-voltage protection (OVP) and input under-voltage protection (UVLO) come standard with the series.
The AM20EWM-NZ is perfect for applications with high insulation requirements such as medical applications.

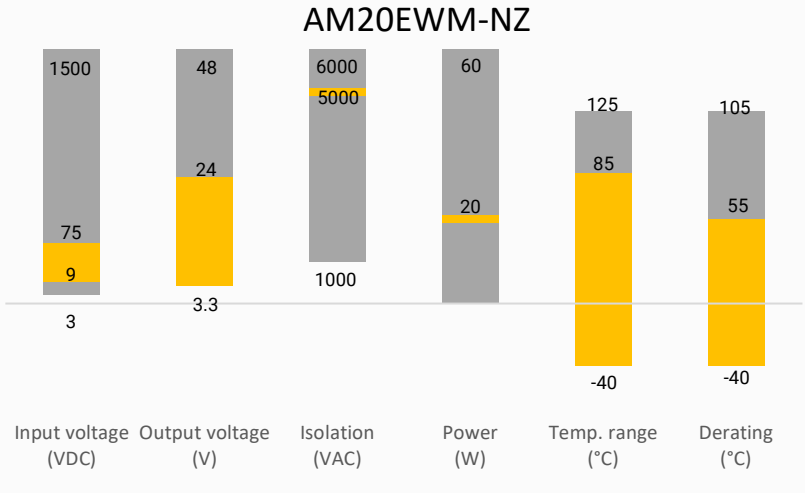
Features

- Operating Temp: -40 °C to +85 °C
- High isolation voltage: 5000VAC
- Low ripple & noise, 200mV (p-p), max.
- Regulated Output
- Output short circuit, over-current, over-voltage, input under-voltage protection
- Design to meet 2xMOPP EN60601-1 medical standard

RoHS

3yr Warranty

Summary



Training

Product Training Video (click to open)

Press Release

Coming Soon!

Application Notes

Applications



Medical Industrial Instrumentation

Models & Specifications

Single Output							
Model	Input Voltage (VDC)	Output Voltage (VDC)	Input Current Max (mA)		Output Current Max (mA)	Maximum Capacitive Load (µF)	Efficiency (%) Full Load Typ.
			No Load	Full Load			
AM20EWM-2403SH50NZ	24 (9-36)	3.3	50	992	5000	10000	85
AM20EWM-2405SH50NZ	24 (9-36)	5	50	992	4000	10000	86
AM20EWM-2412SH50NZ	24 (9-36)	12	15	992	1666	4700	86
AM20EWM-2415SH50NZ	24 (9-36)	15	15	992	1333	1600	87
AM20EWM-2424SH50NZ	24 (9-36)	24	15	992	833	470	89
AM20EWM-4803SH50NZ	48 (18-75)	3.3	30	490	5000	10000	86
AM20EWM-4805SH50NZ	48 (18-75)	5	30	490	4000	10000	87
AM20EWM-4812SH50NZ	48 (18-75)	12	10	491	1666	4700	87
AM20EWM-4815SH50NZ	48 (18-75)	15	10	491	1333	1600	88
AM20EWM-4824SH50NZ	48 (18-75)	24	10	491	833	470	89

Input Specification				
Parameters	Conditions	Typical	Maximum	Units
Input voltage	24VDC	9-36	40	VDC
	48VDC	18-75	80	
Input reflected ripple current		30		mA
Absolute maximum rating	24VDC, 1s max.	≥ -0.7	50	VDC
	48VDC, 1s max.	≥ -0.7	100	
Start-up voltage	24VDC		9	VDC
	48VDC		18	
Shut down voltage	24VDC	6.5		VDC
	48VDC	15.5		
On/Off Control	On - Ctrl pin open or apply 3.5-12V Off - Ctrl pin connect to GND or apply 0-1.2V; Idle current 8mA max.			

Isolation Specification				
Parameters	Conditions	Typical	Maximum	Units
Tested isolation voltage	Input / output 60 sec, ≤ 1mA	5000		VAC
Resistance	500VDC	≥10000		MΩ
Capacitance	100KHz, 0.1V	40		pF
Patient leakage current	240VAC/60Hz	3.6	5	µA
Insulation	Transformer creepage, clearance	≥8		mm

Output Specification

Parameters	Conditions		Typical	Maximum	Units
Voltage accuracy			±1	±2	%
Line regulation	LL – HL 100% load		±0.2	±0.5	%
Load regulation	5% - 100% load		±0.5	±1	%
	0% - 5% load		±5		
Short circuit protection	Continues, Auto recovery				
Over current protection			180	260	% Io
Over voltage protection			≥110	160	% Vo
Transient Recovery Time	Nominal input, 25% load step change		300	500	µs
Transient Response Deviation*	Nominal input, 25% load step change	3.3V, 5V model	±5	±8	%
		others	±3	±5	
Ripple & Noise**	20MHz bandwidth	3.3V, 5V model	100	200	mV pk-pk
		AM20EWM-2415SH50NZ	80	150	
		AM20EWM-2424SH50NZ			
		AM20EWM-4824SH50NZ			
		AM20EWM-2412SH50NZ	50	100	
		AM20EWM-4812SH50NZ			
		AM20EWM-4815SH50NZ			

*An 270µF electrolytic capacitor is required for 3.3V model.
**Ripple & noise is ±10% Vout max. for 3.3V, 5V model and 5% Vout max. for other models.

General Specifications

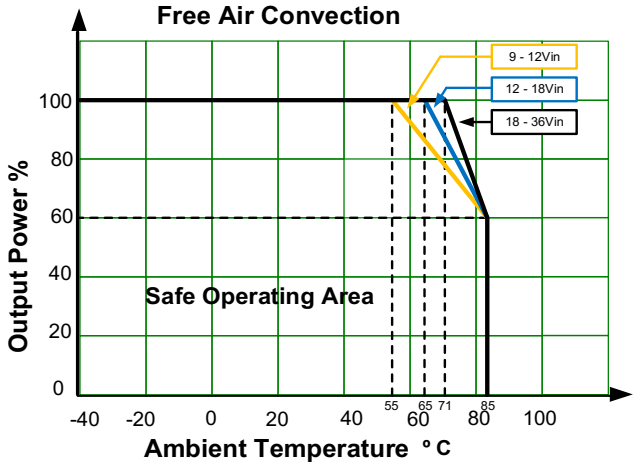
Parameters	Conditions	Typical	Maximum	Units
Switching frequency*	100% Load	280		KHz
Operating temperature	With derating	-40 to +85		°C
Storage temperature		-55 to +125		°C
Manual soldering temperature	1.5mm distance from case ≤ 10s		300	°C
Wave soldering temperature	10s max.		260	°C
Temperature coefficient	100% Load		± 0.03	%/ °C
Cooling	Free air convection			
Humidity	Non-condensing		95	% RH
Weight		27.0		g
Case material	Plastic (flammability to UL 94V-0)			
Dimensions (L x W x H)	2.03 x 1.04 x 0.47 inches (51.50 × 26.50 × 12.00 mm)			
Vibration	10-150Hz, 5G, 0.75mm, along all axis			
MTBF	> 1 000 000 hrs (MIL-HDBK -217F, t=+25°C)			

*Switching frequency reduces when load under 50%.
NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

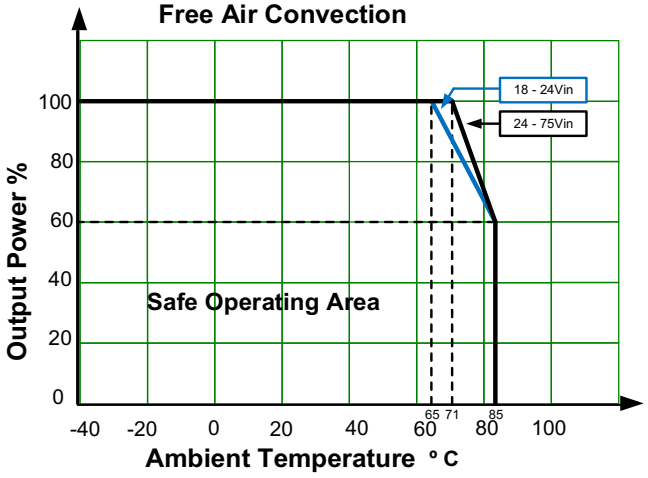
Safety Specifications		
Parameters		
Standards	Design to meet 2xMOPP EN60601-1 3rd, EN62368	
	EMI - Conducted and radiated emission	CISPR32/EN55032 Class A without additional components Class B with recommended EMC circuit 2-B (For AM20EWM-2412SH50NZ use recommended EMC circuit 1)
	Electrostatic Discharge Immunity	IEC/EN 61000-4-2, Contact ±8KV, Air ±15KV, Criteria B
	RF, Electromagnetic Field Immunity	IEC/EN 61000-4-3, 10V/m, Criteria A
	Electrical Fast Transient/Burst Immunity	IEC/EN 61000-4-4, 100KHz, ±4KV, with recommended EMC circuit 2-A, Criteria B
	Surge Immunity	IEC/EN 61000-4-5, L-L ±2KV with recommended EMC circuit 2-A, Criteria B
	RF, Conducted Disturbance Immunity	IEC/EN 61000-4-6, 10Vr.m.s, Criteria A
	Power frequency Magnetic Field Immunity	IEC 61000-4-8: 30A/m, Continuous, Criteria A

Derating

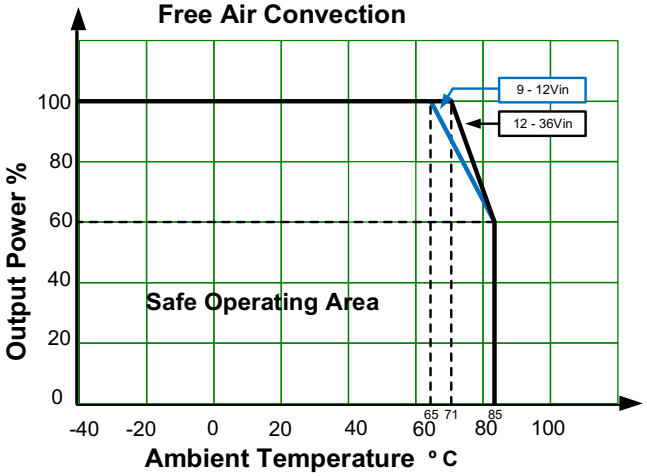
AM20EWM-2403SH50NZ, AM20EWM-2405SH50NZ



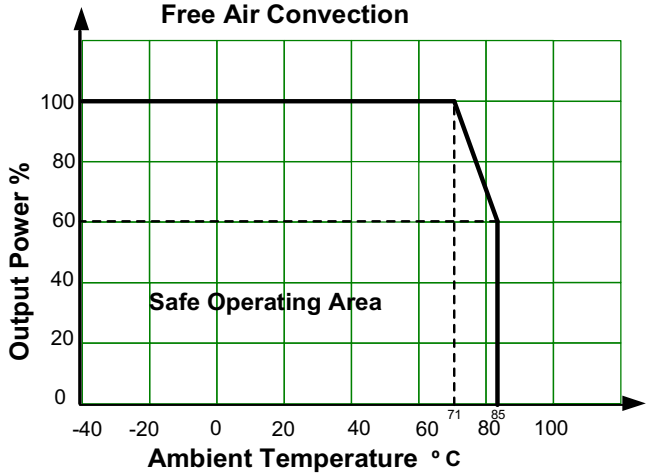
AM20EWM-4803SH50NZ, AM20EWM-4805SH50NZ



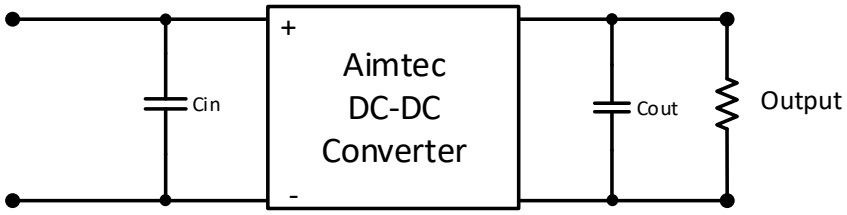
AM20EWM-2412SH50NZ, AM20EWM-2415SH50NZ



Other models

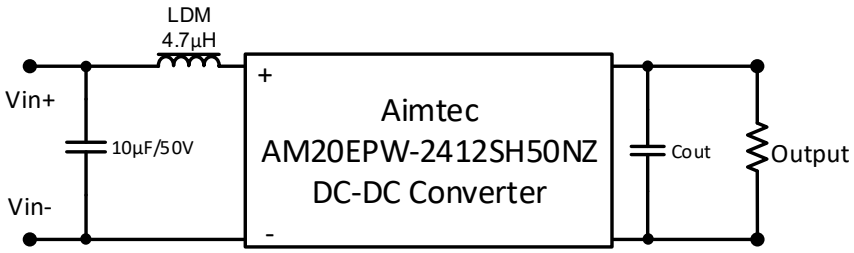


Typical Application Circuit

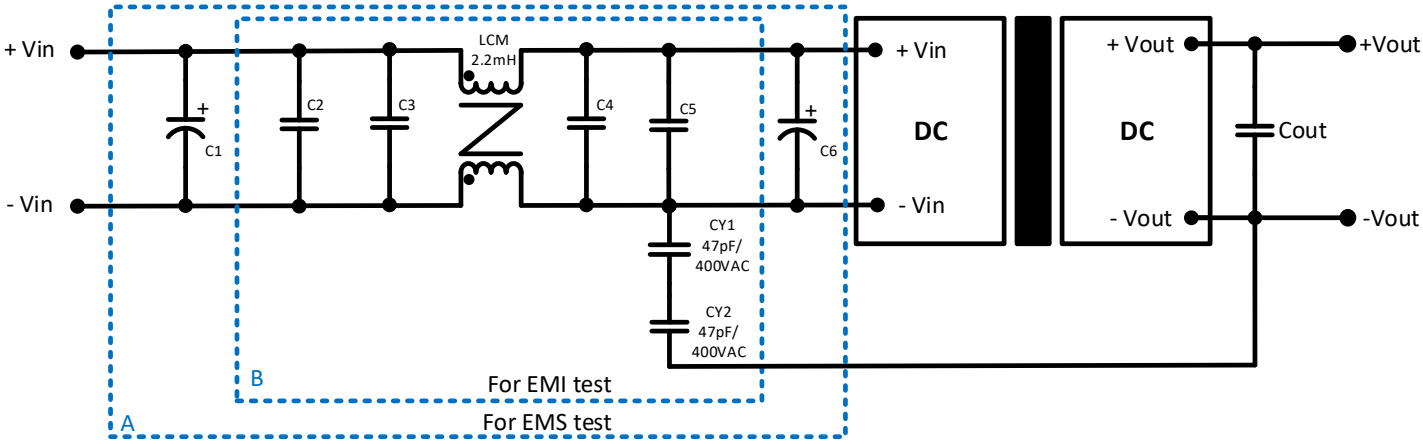


Vin	Cin	Cout	
		3.3Vout	Others
24V	100µF	270µF	10µF
48V	10 - 47µF	270µF	10µF

Recommended EMC Circuit 1



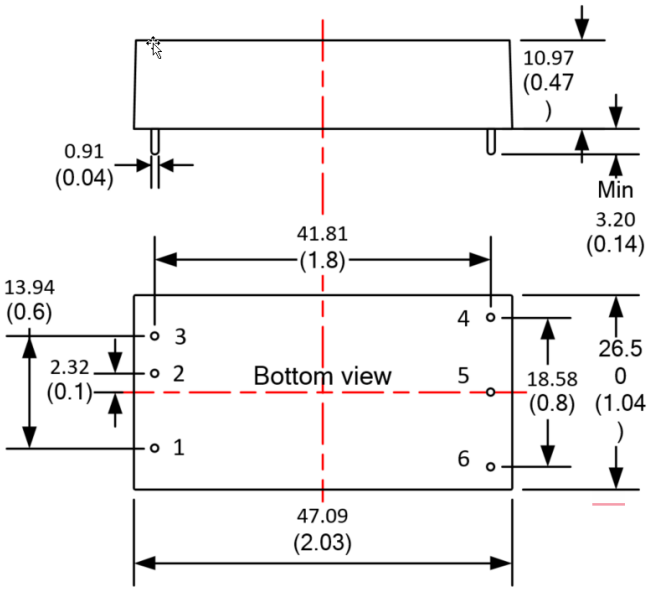
Recommended EMC Circuit 2

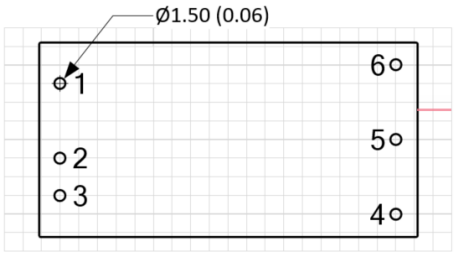


Notes:Part A for EMS filtering and Part B is used for EMI filtering.

	24Vin	48Vin
C1 / C6	680µF / 50V	330µF / 100V
C2 / C3 / C4 / C5	10µF / 50V	10µF / 100V
CY1 / CY2	3.3V / 5V output model required	

Dimensions





Grid size: 2.54 x 2.54 mm

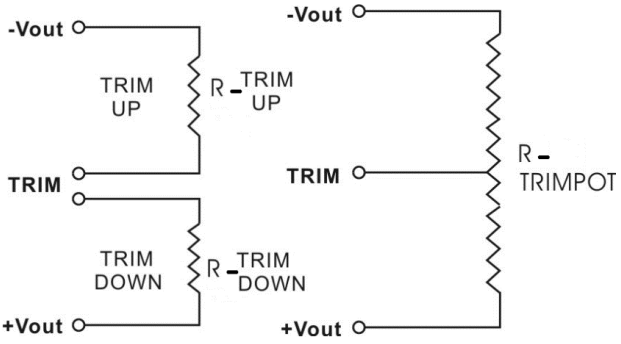
Note:
Unit: mm (inch)
Pin tolerance: ±0.1 (0.004)
General tolerance: ±0.5 (0.02)

Pin Out Specifications	
Pin	Function
1	Ctrl
2	-V Input
3	+V Input
4	+V Output
5	-V Output
6	Trim

Trimming

Output voltage can be externally trimmed by utilizing the methods as shown below

Fixed Resistor **Variable Potentiometer**



3.3V output models

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	3.267	3.234	3.201	3.168	3.135	3.102	3.069	3.036	3.003	2.97
Rt down (KΩ)	195.744	109.218	73.096	53.27	40.741	32.108	25.797	20.983	17.19	14.124
Trim up %	1	2	3	4	5	6	7	8	9	10

Vout (VDC)	3.333	3.366	3.399	3.432	3.465	3.498	3.531	3.564	3.597	3.63
Rt up (KΩ)	308.349	105.149	60.286	40.58	29.504	22.407	17.472	13.842	11.058	8.857

5V output models

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	4.95	4.9	4.85	4.8	4.75	4.7	4.65	4.6	4.55	4.5
Rt down (KΩ)	106.981	53.954	33.797	23.178	16.623	12.173	8.955	6.519	4.611	3.077
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	5.05	5.1	5.15	5.2	5.25	5.3	5.35	5.4	5.45	5.5
Rt up (KΩ)	178.156	73.079	43.774	30	21.998	16.767	13.081	10.344	8.23	6.549

12V output models

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	11.88	11.76	11.64	11.52	11.4	11.28	11.16	11.04	10.92	10.8
Rt down (KΩ)	819.546	401.372	259.971	188.888	146.115	117.548	97.118	81.781	69.845	60.29
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	12.12	12.24	12.36	12.48	12.6	12.72	12.84	12.96	13.08	13.2
Rt up (KΩ)	217.33	99.886	61.311	42.129	30.653	23.016	17.569	13.486	10.314	7.777

15V output models

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	14.85	14.7	14.55	14.4	14.25	14.1	13.95	13.8	13.65	13.5
Rt down (KΩ)	1139.984	562.028	366.415	268.044	208.839	169.294	141.009	119.775	103.248	90.019
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	15.15	15.3	15.45	15.6	15.75	15.9	16.05	16.2	16.35	16.5
Rt up (KΩ)	229.923	106.022	65.367	45.158	33.07	25.027	19.29	14.991	11.65	8.979

24V output models

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	23.76	23.52	23.28	23.04	22.8	22.56	22.32	22.08	21.84	21.6
Rt down (KΩ)	1641.145	916.523	628.023	472.994	376.213	310.045	261.948	225.408	196.708	173.567
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	24.24	24.48	24.72	24.96	25.2	25.44	25.68	25.92	26.16	26.4
Rt up (KΩ)	363.754	136.467	78.989	52.775	37.771	28.052	21.245	16.211	12.337	9.264

NOTE: 1. Datasheets are updated as needed and as such, specifications are subject to change without notice. Once printed or downloaded, datasheets are no longer controlled by Aimtec; refer to www.aimtec.com for the most current product specifications. **2.** Product labels shown, including safety agency certifications on labels, may vary based on the date manufactured. **3.** Mechanical drawings and specifications are for reference only. **4.** All specifications are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified. **5.** Aimtec may not have conducted destructive testing or chemical analysis on all internal components and chemicals at the time of publishing this document. CAS numbers and

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